# Katherine Johnson

**Katherine Coleman Goble Johnson** (born August 26, 1918) is an African-American mathematician whose calculations of orbital mechanics as a NASA employee were critical to the success of the first and subsequent U.S. manned spaceflights.[2] During her 35-year career at NASA and its predecessor, she earned a reputation for mastering complex manual calculations and helped the space agency pioneer the use of computers to perform the tasks.

Johnson's work included calculating trajectories, launch windows and emergency return paths for Project Mercury spaceflights, including those of astronauts Alan Shepard, the first American in space, and John Glenn, the first American in orbit, and rendezvous paths for the Apollo lunar lander and command module on flights to the Moon.[2][3][4] Her calculations were also essential to the beginning of the Space Shuttle program,[2] and she worked on plans for a mission to Mars. In 2015, President Barack Obama awarded Johnson the Presidential Medal of Freedom.[5] She was portrayed by Taraji P. Henson as a lead character in the 2016 film *Hidden Figures*.

**Katherine Johnson**

Katherine Johnson in 2008

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|---|---|
| **Born** | Katherine Coleman<br>August 26, 1918<br>White Sulphur Springs, West Virginia, U.S. |
| **Residence** | Hampton, Virginia |
| **Nationality** | American |
| **Education** | West Virginia State College<br>B.S. (summa cum laude), 1937<br>Mathematics & French[1] |
| **Occupation** | Physicist, mathematician |
| **Employer** | NACA, NASA 1953-1988 |
| **Known for** | Calculating the trajectories for many NASA manned missions |
| **Spouse(s)** | James Goble (m. 1939–1956)<br>Jim Johnson (m. 1959) |
| **Children** | 3 |

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## Early life

Katherine Johnson was born Katherine Coleman in 1918 in White Sulphur Springs, West Virginia, to Joylette and Joshua Coleman.[6][7] She was the youngest of four children.[8] Her mother was a teacher and her father was a lumberman, farmer, handyman, and worked at the Greenbrier Hotel.[6][9]

Johnson showed strong mathematical abilities from an early age. Because Greenbrier County did not offer public schooling for African-American students past the eighth grade, the Colemans arranged for their children to attend high school in Institute, West Virginia. This school was on the campus of West Virginia State College (WVSC, now West Virginia State University).[10] Johnson was enrolled when she was only 10 years old.[11] The family split their time between Institute during the school year and White Sulphur Springs in the summer

Johnson graduated from high school at 14 and entered West Virginia State, a historically black college.[12] As a student, she took every math course offered by the college. Multiple professors mentored her, including chemist and mathematician Angie Turner King, who had also mentored Johnson throughout high school, and W. W. Schieffelin Claytor, the third African-American to receive a PhD in math. Claytor added new math courses just for Katherine. She graduated *summa cum laude* in 1937, with degrees in mathematics and French, at age 18.[5][7][9][11][13] She took on a teaching job at a black public school in Marion, Virginia.[12][14]

In 1939, after marrying her first husband, James Goble, Johnson left her teaching job and enrolled in a graduate math program. She quit after one year, after becoming pregnant and choosing to focus on her family.[12] At the time of her entry, she was the first African-American woman to attend graduate school at West Virginia University in Morgantown, West Virginia. Through WVSC's president, Dr. John W. Davis, she became one of three African-American students,[12] and the only woman, selected to integrate the graduate school after the United States Supreme Court ruling *Missouri ex rel. Gaines v. Canada* (1938). The court had ruled that states that provided public higher education to white students also had to provide it to black students, to be satisfied either by establishing black colleges and universities or by admitting black students to previously white-only universities.[9][15]

# Career

Johnson decided on a career as a research mathematician, although this was a difficult field for African Americans and women to enter. The first jobs she found were in teaching. At a family gathering in 1952 a relative mentioned that the National Advisory Committee for Aeronautics (NACA) was hiring mathematicians.[12] (It was superseded by the agency NASA in 1958.) At the Langley Memorial Aeronautical Laboratory, based in Hampton, Virginia, near Langley Field, NACA hired African-American mathematicians as well as whites for their Guidance and Navigation Department. Johnson was offered a job in 1953. She accepted and became part of the early NASA team.

Johnson at NASA in 1966

According to an oral history archived by the National Visionary Leadership Project:

> At first she [Johnson] worked in a pool of women performing math calculations. Katherine has referred to the women in the pool as virtual "computers who wore skirts". Their main job was to read the data from the black boxes of planes and carry out other precise mathematical tasks. Then one day, Katherine (and a colleague) were temporarily assigned to help the all-male flight research team. Katherine's knowledge of analytic geometry helped make quick allies of male bosses and colleagues to the extent that, "they forgot to return me to the pool". While the racial and gender barriers were always there, Katherine says she ignored them. Katherine was assertive, asking to be included in editorial meetings (where no women had gone before). She simply told people she had done the work and that she belonged.[16]

From 1953 to 1958, Johnson worked as a "computer",[17] analyzing topics such as gust alleviation for aircraft. Originally assigned to the West Area Computers section supervised by mathematician Dorothy Vaughan, Johnson was reassigned to the Guidance and Control Division of Langley's Flight Research Division. It was staffed by white male engineers.[18] In keeping with state racial segregation laws, and federal workplace segregation introduced under President Woodrow Wilson in the early 20th century, Johnson and the other African-American women in the computing pool were required to work, eat, and use restrooms that were separate from those of their white peers. Their office was labeled as "Colored Computers". In an interview with WHRO-TV, Johnson stated that she

"didn't feel the segregation at NASA, because everybody there was doing research. You had a mission and you worked on it, and it was important to you to do your job ... and play bridge at lunch." She added: "I didn't feel any segregation. I knew it was there, but I didn't feel it."[19]

NACA disbanded the colored computing pool in 1958 when it was superseded by NASA, which adopted digital computers. Although the installation was desegregated,[18] forms of discrimination were still pervasive. Johnson recalled that era:

> We needed to be assertive as women in those days – assertive and aggressive – and the degree to which we had to be that way depended on where you were. I had to be. In the early days of NASA women were not allowed to put their names on the reports – no woman in my division had had her name on a report. I was working with Ted Skopinski and he wanted to leave and go to Houston ... but Henry Pearson, our supervisor – he was not a fan of women – kept pushing him to finish the report we were working on. Finally, Ted told him, "Katherine should finish the report, she's done most of the work anyway." So Ted left Pearson with no choice; I finished the report and my name went on it, and that was the first time a woman in our division had her name on something.[20]

From 1958 until her retirement in 1986, Johnson worked as an aerospace technologist, moving during her career to the Spacecraft Controls Branch. She calculated the trajectory for the May 5, 1961 space flight of Alan Shepard, the first American in space.[2] She also calculated the launch window for his 1961 Mercury mission.[21] She plotted backup navigation charts for astronauts in case of electronic failures.[6] When NASA used electronic computers for the first time to calculate John Glenn's orbit around Earth, officials called on Johnson to verify the computer's numbers; Glenn had asked for her specifically and had refused to fly unless Johnson verified the calculations.[2][22][23] Biography.com states these were "far more difficult calculations, to account for the gravitational pulls of celestial bodies".[3] Author Margot Lee Shetterly stated, "So the astronaut who became a hero, looked to this black woman in the still-segregated South at the time as one of the key parts of making sure his mission would be a success." She added that, in a tim where computing was "women's work" and engineering was left to men, "it really does have to do with us over the course of time so of not valuing that work that was done by women, however necessary, as much as we might. And it has taken history to get a perspective on that."[24]

Johnson later worked directly with digital computers. Her ability and reputation for accuracy helped to establish confidence in the new technology.[3] In 1961, her work helped to ensure that Alan Shepard's Freedom 7 Mercury capsule would be quickly found after landing, using the accurate trajectory that had been established.[25]

She also helped to calculate the trajectory for the 1969 Apollo 11 flight to the Moon.[2][3] During the moon landing, Johnson was at a meeting in the Pocono Mountains. She and a few others crowded around a small television screen watching the first steps on the moon. In 1970, Johnson worked on the Apollo 13 moon mission. When the mission was aborted, her work on backup procedures and charts helped set a safe path for the crew's return to Earth,[3] creating a one-star observation system that would allow astronauts to determine their location with accuracy. In a 2010 interview, Johnson recalled, "Everybody was concerned about them getting there. We were concerned about them getting back."[26] Later in her career, Johnson worked on the Space Shuttle program, the Earth Resources Satellite,[2][3] and on plans for a mission to Mars.[27]

# Personal life

In 1939, Katherine (then Coleman) married James Francis Goble. They had three daughters: Constance, Joylette, and Katherine. In 1953, she and James moved their family to Newport News to pursue a new job opportunity. In 1956, James Goble died due to an inoperable brain tumor.

Katherine Goble remarried in 1959 to James A. Johnson, who had been a second lieutenant in the army and was a veteran of the Korean War.[20]

Katherine Johnson continued her career at NASA. She sang in the choir of Carver Presbyterian Church for 50 years. She has been a member of Alpha Kappa Alpha since college, the first sorority established by and for African-American women. Johnson and her husband, who have six grandchildren and 11 great-grandchildren, live in Hampton, Virginia.[28] She continues to encourage her

grandchildren and students to pursue careers in science and technology.[29]

# Legacy and honors

Johnson co-authored 26 scientific papers.[16][30] Her social influence as a pioneer in space science and computing is demonstrated by the honors she has received and her status as a role model for a life in science.[31][30][32][33] Since 1979 (before she retired from NASA), Johnson has been listed among African Americans in science and technology.[34][35] Johnson was named West Virginia State College Outstanding Alumnus of the Year in 1999. President Barack Obama presented Johnson with the Presidential Medal of Freedom, one of 17 Americans so honored on November 24, 2015. She was cited as a pioneering example of African-American women in STEM.[36]

Being awarded the Presidential Medal of Freedom in 2015

On May 5, 2016, a new 40,000-square-foot (3,700 $m^2$) building was named "Katherine G. Johnson Computational Research Facility" and formally dedicated at the agency's Langley Research Center in Hampton, Virginia. The facility officially opened its doors on September 22, 2017.[37] Johnson attended this event, which also marked the 55th anniversary of astronaut Alan Shepard's historic rocket launch and splashdown, a success Johnson helped achieve.[38] At the ceremony, deputy director Lewin said this about Johnson: "Millions of people around the world watched Shepard's flight, but what they didn't know at the time was that the calculations that got him into space and safely home were done by today's guest of honor, Katherine Johnson".[39] During the event, Johnson also received a Silver Snoopy award; often called the astronaut's award, NASA stated it is given to those "who have made outstanding contributions to flight safety and mission success".[40]

In 2016, Johnson was included in the list of "100 Women", BBC's list of 100 influential women worldwide.[41] NASA stated, "Her calculations proved as critical to the success of the Apollo Moon landing program and the start of the Space Shuttle program, as they did to those first steps on the country's journey into space."[2]

Johnson has been portrayed in the media. The highly acclaimed film *Hidden Figures*, released in December 2016, was based on the non-fiction book of the same title by Margot Lee Shetterly, which was published earlier that year. It follows Johnson and other female African-American mathematicians (Mary Jackson and Dorothy Vaughan) who worked at NASA. Taraji P. Henson plays Johnson in the film.[23] Appearing alongside Henson at the 89th Academy Awards, Johnson received a standing ovation from the audience.[42] In an earlier interview, Johnson offered the following comment about the movie: "It was well-done. The three leading ladies did an excellent job portraying us."[43] In a 2016 episode of the NBC series *Timeless*, titled "Space Race", the mathematician is portrayed by Nadine Ellis.[44]

West Virginia State University announced plans for an endowed STEM scholarship in honor of Johnson and a life-size statue of her on campus.[45] On May 12, 2018 she was awarded an honorary doctorate by the College of William and Mary.[46]

In 2016, science writer Maia Weinstock developed a prototype Lego for Women of NASA and included Johnson, who declined to have her likeness printed for the final product.[47] In 2018, Mattel announced a Barbie doll in the likeness of Johnson, with a NASA identity badge.[48]

# Awards

- Group Achievement Award presented to NASA's Lunar Spacecraft and Operations team – for pioneering work in the field of navigation supporting the spacecraft that orbited and mapped the moon in preparation for the Apollo program[16]
- 1971, 1980, 1984, 1985, 1986: NASA Langley Research Center Special Achievement award[49]
- 1998, Honorary Doctor of Laws, from SUNY Farmingdale[16][50]

- 1999, West Virginia State College Outstanding Alumnus of the Year[16][50]
- 2006, Honorary Doctor of Science by the Capitol College, Laurel, Maryland[16][51]
- 2010, Honorary Doctorate of Science from Old Dominion University, Norfolk, Virginia[52]
- 2014, De Pizan Honor from National Women's History Museum[53]
- 2015, NCWIT Pioneer in Tech Award[54]
- 2015, Presidential Medal of Freedom[55]
- 2016, Silver Snoopy award from Leland Melvin[56]
- 2016, Astronomical Society of the Pacific's Arthur B.C. Walker II Award[57]
- 2016, Presidential Honorary Doctorate of Humane Letters from West Virginia University, Morgantown, West Virginia[58]
- 2017, Daughters of the American Revolution (DAR) Medal of Honor
- 2017, Katherine G. Johnson Computational Research Facility in Hampton, Virginia, opened on September 22, 2017, and so dedicated to Johnson[59]
- May 12, 2018, Honorary Doctorate of Science from the College of William and Mary, Williamsburg, Virginia[60][61]
- February 22, 2019, NASA renamed the Independent Verification and Validation Facility to the Katherine Johnson Independent Verification and Validation Facility[62]
- April 29, 2019, Honorary degree from the University of Johannesburg, South Africa[63]

# See also

- Dorothy Vaughan, mathematician and self-made computer programmer
- Annie Easley, mathematician
- Mary Jackson (engineer), mathematician and aerospace engineer
- List of African-American women in STEM fields
- List of West Virginia University alumni
- Mathematical Tables Project, pioneering human computer group
- Timeline of women in science

# References


1. Shetterly, Margot Lee (August 3, 2017). "Katherine Johnson Biography" (https://www.nasa.gov/content/katherine-johnson-biography). NASA. Retrieved April 7, 2018.
2. Smith, Yvette (November 24, 2015). "Katherine Johnson: The Girl Who Loved to Count" (http://www.nasa.gov/feature/katherine-johnson-the-girl-who-loved-to-count). NASA. Retrieved February 12, 2016. "Her calculations proved as critical to the success of the Apollo Moon landing program and the start of the Space Shuttle program, as they did to those first steps on the country's journey into space".
3. "Katherine G. Johnson Biography" (http://www.biography.com/people/katherine-g-johnson-101016). Biography.com. October 10, 2016. Retrieved January 15, 2017.
4. Shetterly, Margot Lee (December 1, 2016). "Katherine Johnson Biography" (https://www.nasa.gov/content/katherine-johnson-biography). *NASA*. NASA. Retrieved March 2, 2017. "As a part of the preflight checklist, Glenn asked engineers to 'get the girl'—Katherine Johnson—to run the same numbers through the same equations that had been programmed into the computer, but by hand, on her desktop mechanical calculating machine... When asked to name her greatest contribution to space exploration, Katherine Johnson talks about the calculations that helped synch Project Apollo's Lunar Lander with the moon-orbiting Command and Service Module".
5. Gutman, David (November 16, 2015). "WV native, NASA mathematician to receive Presidential Medal of Freedom" (http://www.wvgazettemail.com/article/20151116/GZ01/151119605/1101). *WV Gazette Mail: Charleston Gazette-Mail*. Retrieved February 12, 2016.
6. "Katherine Johnson – Oral History" (http://www.visionaryproject.org/johnsonkatherine/). *National Visionary Leadership Project*. Retrieved February 12, 2016.
7. Gale, Thomas (2005). "Johnson, Katherine Coleman Goble" (http://www.encyclopedia.com/doc/1G2-2694600029.html). *Encyclopedia.com*. Cengage Learning. Retrieved February 15, 2016.
8. Shetterly, Margot Lee (December 1, 2016). "The Woman the Mercury Astronauts Couldn't Do Without" (http://nautil.us/issue/43/Heroes/the-woman-the-mercury-astronauts-couldnt-do-without). *Nautilus*. Retrieved December 8, 2016.

9. Gutman, David (December 26, 2015). "West Virginian of the Year: Katherine G. Johnson" (http://www.wvgazettemail.com/news/20151226/west-virginian-of-the-year-katherine-g-johnson). *Charleston Gazette-Mail*. Retrieved February 12, 2016.
10. Shetterly, Margot Lee (December 1, 2016). "From Hidden to Modern Figures – Katherine Johnson Biography" (https://www.nasa.gov/content/katherine-johnson-biography). *NASA*. NASA. Retrieved March 1, 2017. "By thirteen, she was attending the high school on the campus of historically black West Virginia State College. ... enrolled in the college itself, where she made quick work of the school's math curriculum and found a mentor in math professor W. W. Schieffelin Claytor, the third African American to earn a PhD in Mathematics. Katherine graduated with highest honors in 1937 and took a job teaching at a black public school in Virginia."
11. Yvette Smith, ed. (November 24, 2015). "Katherine Johnson: The Girl Who Loved to Count" (https://www.nasa.gov/feature/katherine-johnson-the-girl-who-loved-to-count). *NASA*. NASA. Retrieved March 1, 2017. "Fascinated by numbers and smart to boot, for by the time she was 10 years old, she was a high school freshman – a truly amazing feat in an era when school for African-Americans normally stopped at eighth grade for those who could indulge in that luxury. Katherine skipped several grades to graduate from high school at 14 and from college at 18."
12. Loff, Sarah (November 22, 2016). "Katherine Johnson Biography" (https://www.nasa.gov/content/katherine-johnson-biography). *NASA*. Retrieved February 1, 2017.
13. "Katherine G. Johnson – Presidential Honorary Doctorate of Humane Letters" (http://honorarydegrees.wvu.edu/katherine-g-johnson). *West Virginia University*. WVU. 2015. Retrieved March 1, 2017. "Katherine Johnson graduated from high school at age 14 and from college at 18".
14. Porter-Nichols, Stephanie (January 24, 2017). "Council honors one-time Marion teacher Katherine Johnson of 'Hidden Figures'" (http://www.swvatoday.com/news/smyth_county/article_35c83f32-df64-11e6-a8e6-bfcf3a8856af.html). *SWVA Today*.
15. "Missouri ex rel. Gaines v Canada 305 U.S. 337 (1938)" (https://supreme.justia.com/cases/federal/us/305/337/case.html). *Justia US Supreme Court* 1938. Retrieved February 12, 2016.
16. "Oral History Archive: Katherine Johnson" (http://www.visionaryproject.org/johnsonkatherine/). *National Visionary Leadership Project* 2005. Retrieved December 29, 2016.
17. Hodges, Jim (August 26, 2008). "She Was a Computer When Computers Wore Skirts" (http://www.nasa.gov/centers/langley/news/researchernews/rn_kjohnson.html). *Langley Research Center*. NASA. Retrieved December 29, 2016.
18. Buckley, Cara (September 5, 2016). "On Being a Black Female Math Whiz During the Space Race" (https://www.nytimes.com/2016/09/06/books/on-being-black-female-math-whizzes-during-the-space-race.html). *The New York Times*. ISSN 0362-4331 (https://www.worldcat.org/issn/0362-4331). Retrieved September 6, 2016.
19. "KATHERINE JOHNSON INTERVIEW: NASA'S HUMAN COMPUTER" (http://www.historyvshollywood.com/video/katherine-johnson-interview-nasa/). *HistoryvsHollywood.com*. CTF Media. 2016. Retrieved March 2, 2017.
20. "Katherine Coleman Goble Johnson" (http://www-history.mcs.st-and.ac.uk/Biographies/Johnson_Katherine.html). *School of Mathematics & Statistics University of St Andrews, UK*. School of Mathematics & Statistics University of St Andrews, UK. Retrieved March 1, 2017. "Excerpt from W. Warren, Katherine Coleman Goble Johnson, in Black Women Scientists in the United States (Indiana University Press, 1999), 140–147".
21. Whitney, A. K. (2015). "The Black Female Mathematicians Who Sent Astronauts to Space" (http://mentalfloss.com/article/71576/black-female-mathematicians-who-sent-astronauts-space). Retrieved September 10, 2016.
22. "Makers Profile: Katherine G. Johnson" (http://www.makers.com/katherine-g-johnson). *Makers*. Retrieved May 24, 2015.
23. Sloat, Sarah (August 15, 2016). "'Hidden Figures' Gives NASA Mathematicians Long Overdue Movie" (https://www.inverse.com/article/19694-5-facts-about-katherine-johnson-hidden-figure). Inverse.com. Retrieved January 15, 2017.
24. "'Hidden Figures': How Black Women Did The Math That Put Men on the Moon" (https://www.npr.org/2016/09/25/495179824/hidden-figures-how-black-women-did-the-math-that-put-men-on-the-moon). *All Things Considered*. NPR. September 25, 2016. Retrieved March 1, 2017.
25. Bartels, Meghan (August 22, 2016). "The unbelievable life of the forgotten genius who turned Americans' space dreams into reality" (http://www.businessinsider.com/katherine-johnson-hidden-figures-nasa-human-computers-2016-8/#johnsons-time-as-a-teacher-hasnt-ever-really-ended-she-strongly-believes-people-need-to-learn-how-to-learn-i-teach-you-what-the-problem-is-how-to-attack-it--if-you-attack-it-properly-youll-get-the-answer-she-said-in-a-2011-interview-28). *Business Insider*. Business Insider Inc. Retrieved March 2, 2017. "In 1961, on the strength of Johnson's work, Alan Shepherd became the first American to go into space. Johnson calculated his trajectory, the path he would take from launch to landing. If she was wrong, the best case scenario was that NASA wouldn't have known where to pick him up."

26. Bartels, Meghan (August 22, 2016). "The unbelievable life of the forgotten genius who turned Americans' space dreams into reality" (http://www.businessinsider.com/katherine-johnson-hidden-figures-nasa-human-computers-2016-8/#johnsons-time-as-a-teacher-hasnt-ever-really-ended-she-strongly-believes-people-need-to-learn-how-to-learn-i-teach-you-what-the-problem-is-how-to-attack-it--if-you-attack-it-properly-youll-get-the-answer-she-said-in-a-2011-interview-28). *Business Insider*. Business Insider Inc Retrieved March 2, 2017. "There were an incredible number of factors at play: Earth's rotation, the Moon's location, when you took off, when you reached the Moon. "It was intricate, but it was possible," she said. The mission went according to plan. Her numbers weren't just there to make sure everything went right – she also stepped in when something went wrong. In 1970, Apollo 13, which had been bound for the Moon, was stymied by the explosions of two oxygen tanks. Johnson was one of the mathematicians who scrambled to calculate a safe path back to Earth for the stranded astronauts. That work became the basis of a system that only requires one star observation matched with an onboard star chart for astronauts to pinpoint their location."
27. Guglielmi, Jodi (August 26, 2016). "Katherine Johnson, Legendary Mathematician and Inspiration for the Upcoming Film Hidden Figures, Turns 98" (http://people.com/movies/katherine-johnson-turns-98/) *People*. Retrieved January 15, 2017.
28. Hopkins, Anna (January 30, 2017). "Leading couple depicted in award-winning film Hidden Figures still living and residing in the town where the film takes place" (http://www.dailymail.co.uk/news/article-4173776/Hidden-figures-Johnson-couple-living-hometown.html) *The Daily Mail*. Retrieved April 8, 2018.
29. "The Untold History of Women in Science and Technology: Katherine Johnson" (https://obamawhitehouse.archives.gov/node/311241). *The White House*. Archived from the original (https://www.whitehouse.gov/woen-in-stem) on January 20, 2017. Retrieved October 22, 2016.
30. "Human computers: Katherine G. Johnson" (http://crgis.ndc.nasa.gov/historic/Katherine_Johnson) *NASA History*. Retrieved August 2, 2015.
31. "'Mop Top' the 'Hip Hop' Scientist Celebrates African-Americans in the Sciences: Katherine G. Johnson" (http://www.moptopshop.com/katherine_johnson.html) 2003
32. "Black history... Katherine G Johnson (1918 –retired)" (http://www.scienceyear.com/text_only/outthere/black_history/johnson.html) Archived (https://web.archive.org/web/20061021221512/http://www.scienceyear.com/text_only/outthere/black_history/johnson.html) October 21, 2006, at the Wayback Machine, UK-based *Planet Science*
33. "Katherine G. Johnson: Physicist, Space Scientist, Mathematician" (http://library.thinkquest.org/2907/katherine_johnson.html) Archived (https://web.archive.org/web/20090304132115/http://library.thinkquest.org/2907/katherine_johnson.html) March 4, 2009, at the Wayback Machine, Oracle Think Quest Education Foundation Library
34. "Black Contributors to Science and Energy Technology" (http://www.eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=ED170154) 1979, anonymous, U.S. Department of Energy U.S. Government Printing Office (ERIC electronic document)
35. "Black Contributors to Science and Energy Technology" (http://www.africanafrican.com/negroartist/writings/BLACK%20CONTRIBUTORS/black%20contributors%20to%20science%20and%20energy%20technology.htm) 1979, anonymous, U.S. Department of Energy U.S. Government Printing Office (manually scanned images)
36. Ford, Knatokie (November 30, 2015). "Honoring NASA's Katherine Johnson, STEM Pioneer" (https://www.whitehouse.gov/blog/2015/11/25/honoring-nasas-katherine-johnson-stem-pioneer) *Blog, The White House*. Retrieved February 12, 2016.
37. Katherine G. Johnson Computational Research Facility Ribbon Cutting (https://www.youtube.com/watch?v=smTsodvEqM)
38. Northon, Karen (April 28, 2016). "NASA Dedicates Facility to Mathematician, Presidential Medal Winner" (http://www.nasa.gov/press-release/nasa-dedicates-facility-to-mathematician-presidential-medal-winner) Retrieved August 1, 2016.
39. "Katherine Coleman Goble Johnson" (http://www-history.mcs.st-and.ac.uk/Biographies/Johnson_Katherine.html) *School of Mathematics & Statistics University of St Andrews, UK*. School of Mathematics & Statistics University of St Andrews, UK. 2015. Retrieved March 1, 2017. "S. Lewin, NASA Facility Dedicated to Mathematician Katherine Johnson, space.com (5 May 2016)".

40. "Katherine Johnson at NASA Langley Research Center" (https://www.nasa.gov/image-feature/katherine-johnson-at-nasa-langley-research-center) *NASA History*. NASA. August 26, 2016. Retrieved March 1, 2017. "On May 5, 2016, she returned to NASA Langley on the 55th anniversary of Shepard's historic flight, to attend a ceremony where a $30 million, 40,000-square-foot Computational Research Facility was named in her honor. As part of the event, Johnson also received a Silver Snoopy award from Leland Melvin, an astronaut and former NASA associate administrator for education. Often called the astronaut's award, the Silver Snoopy goes to people who have made outstanding contributions to flight safety and mission success".
41. 2016 "BBC 100 Women 2016: Who is on the list?" (https://www.bbc.com/news/world-38012048), BBC News, November 21, 2016. Retrieved November 24, 2016.
42. Maple, Taylor (February 26, 2017). "Katherine Johnson, real-life subject of 'Hidden Figures' receives standing ovation at Oscars" (http://abcnews.go.com/Entertainment/real-life-subject-hidden-figures-receives-standing-ovation/story?id=45755913). Retrieved February 26, 2017.
43. Khan, Amina (February 26, 2017). "Q&A: Our interview with Katherine G. Johnson, the real-life mathematician who inspired 'Hidden Figures'" (http://www.latimes.com/entertainment/la-oscars-2017-89th-academy-awards-q-a-our-interview-with-katherine-g-1488161846-htmlstory.html). *Los Angeles Times*. Los Angeles. Retrieved March 1, 2017.
44. Shoemaker, Allison (November 29, 2016). "Timeless needs to ditch the formula" (http://www.avclub.com/tvclub/timeless-needs-ditch-formula-246556) *The A.V. Club*. Retrieved December 5, 2016.
45. "West Virginia State University to Honor Katherine Johnson with Statue, Scholarship" (http://www.wvstateu.edu/CampusNews/2018/May/West-Virginia-State-University-to-Honor-Katherine.aspx) WVSU.
46. Heymann, Amelia (May 12, 2018). "William and Mary commencement sends graduates out on new adventure" (http://www.vagazette.com/news/va-vg-wm-commencement-20180516-story.html). *The Virginia Gazette*.
47. https://airandspace.si.edu/stories/editorial/women-nasa-lego-prototype-joins-collection (https://airandspace.si.edu/stories/editorial/women-nasa-lego-prototype-joins-collection) Missing or empty | `title=` (help)
48. Petrini, Andi. "Katherine Johnson to be included in Barbie 'Inspiring Women' series" (http://www.dailypress.com/entertainment/dp-fea-katherine-johnson-barbie-20180306-story.html). *latimes.com*. Retrieved September 2, 2018.
49. "Katherine G. Johnson: Biography" (http://www.thehistorymakers.com/biography/katherine-g-johnson-42) *The History Makers*. February 6, 2012 Retrieved January 7, 2017.
50. Katherine Johnson biography (http://www.aaregistry.org/historic_events/view/kathrine-g-johnson-value-nasa) African-American Registry
51. "Live, Learn, Pursue Passion – NASA Mathematician preps Class of 2006 to find its mission" (http://www.capitol-college.edu/files/file/PDFs/Media%20and%20Communications/06_07%20Capitol%20Chronicle.pdf) *Capitol Chronicle*, Summer 2006, Capitol College (12 pages, PDF format)
52. "MLK Event to Feature 'Hidden Figures' Author Margot Lee Shetterly" (http://www.odu.edu/news/2017/1/mlk_observance_previ). *Old Dominion University*. Retrieved April 17, 2019.
53. "De Pizan Honor" (https://www.nwhm.org/depizan14/honorees.html). *National Women's History Museum*.
54. "Katherine Johnson" (https://www.ncwit.org/profile/katherine-johnson). *National Center for Women & Information Technology*. 2015. Retrieved December 7, 2016.
55. Phil Helsel – "Obama honoring Spielberg, Streisand and more with medal of freedom" (http://www.aol.com/article/2015/11/24/obama-honoring-spielberg-streisand-and-more-with-medal-of-freed/21272337/?icid=maing-grid7%7Chtmlvs-sb-bb%7Cdl3%7Csec1_lnk3%26pLid%3D-40526639) *NBC News*, November 24, 2015. Retrieved November 25, 2015
56. "Katherine Johnson at NASA Langley Research Center" (http://www.nasa.gov/image-feature/katherine-johnson-at-nasa-langley-research-center) NASA. September 22, 2016 Retrieved December 5, 2016.
57. "Katherine Johnson to receive the ASP's new Arthur B.C. Walker II Award" (https://www.astrosociety.org/society-news/katherine-johnson-to-receive-the-asps-new-arthur-b-c-walker-ii-award/) *Astronomical Society of the Pacific* 2016. Retrieved December 5, 2016.
58. "Katherine G. Johnson Presidential Honorary Doctorate of Humane Letters" (http://honorarydegrees.wvu.edu/katherine-g-johnson). West Virginia University. September 12, 2016. Retrieved January 10, 2017.
59. Harriot, Michale (September 24, 2017). "NASA Dedicates Building To Hidden Figures Heroine Katherine Johnson" (http://www.theroot.com/nasa-dedicates-building-to-hidden-figures-heroine-kathe-1818701871) The Root. Retrieved September 24, 2017.
60. https://www.wm.edu/news/stories/2018/trailblazing-african-american-women-to-be-honored-at-william-mary-commencement.php

61. https://www.youtube.com/watch?v=_ulneupo2H0
62. Cook, Gina. "NASA Honors 'Hidden Figure' Katherine Johnson" (https://www.nbcwashington.com/entertainment/the-scene/NASA-Renames-Facility-to-Honor-Hidden-Figure-Katherine-Johnson-506249461.html). *NBC4 Washington*. Retrieved February 25, 2019.
63. "Farber, Tanya (April 29, 2019)." "Hidden Nasa genius honoured by SA varsity". The Times Johannesburg. Retrieved April 29, 2019

# Further reading

- Beverly Golemba, *Human Computers: The Women in Aeronautical Research*, unpublished manuscript 1994, NASA Langley Archives.
- Zierdt-Warshaw, Linda; Winkler, Alan; Bernstein, Leonard (2000). *American Women in Technology: an encyclopedia*. Santa Barbara, Calif.: ABC-CLIO. ISBN 1576070727.
- Wini Warren, *Black Women Scientists in the United States*, Indiana University Press, 2000, pp. 140–147. ISBN 9780253336033.
- Brigham Narins, *Notable Scientists: From 1900 to the Present*, Gale Group, 2001, ISBN 9780787617547.

# External links

- "Katherine Johnson Biography". NASA. Retrieved February 1, 2017.
- Katherine G. Johnson Video produced by *Makers: Women Who Make America*
- Introduction by Dr. Ellen Stofan, "The Untold History of Women in Science and Technology", White House.gov
- O'Connor, John J.; Robertson, Edmund F., "Katherine Coleman Goble Johnson", *MacTutor History of Mathematics archive*, University of St Andrews
- "Katherine Johnson". *NASA*. Retrieved August 2, 2015.
- NASA Technical Reports Server (NTRS): Johnson, K. G.

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